A Blueprint for Learning
Mathematics
Seventh Grade

The ***Blueprint for Learning*** is a companion document for the Tennessee Curriculum Standards which are located at www.tennessee.gov/education. Although the curriculum adopted by the State Board of Education in its entirety remains on the web for additional reference, this reformatted version makes the curriculum more accessible to classroom teachers.

Key features of the reformatted version are:

- All grades for each content area are provided in the printed manual.
- The skills within each grade are identified as to whether they are introduced, developed, or have been mastered and are now being maintained at that level.
- The skills correlating with the state criterion referenced test (CRT) are also identified for classroom instruction.
- In the Language Arts section, the assessed skills (performance indicators) are identified not only for the state's CRT in grades 3-8 but also for the writing assessment in grades 5 and 8.
- This guide makes the planning of instruction for students with varying abilities easier to accomplish.
- Teachers can plan and work together to improve school wide student achievement through curriculum integration across content areas and grade levels.
- Teachers can identify current grade level skills as well as those needed to prepare students for the next year.

Skills are coded and identified as Introduced (I), Developing (D), State CRT and Writing Assessed (A), and Mastered and Maintained (M).

- Introduced (I) skills are new skills presented at that grade level. Even though a skill is considered introduced at a grade level, some development would also occur.
- Developing (D) skills are skills that have been introduced at a previous grade level. At this stage of development the skills are being refined and expanded.
- Assessed (A) skills are those skills that are correlated to the state performance indicators for the CRT portion of the achievement test (grades 3-8) and the writing assessment (grades 5 and 8). The identified skills are formally assessed through the CRT; however, all skills are informally assessed in the classroom.
    - For the purpose of data reporting, assessed (A) skills are grouped into categories indicating related skills and knowledge. For example, grammar, mechanics, and usage are grouped together under the grammar (G) category. Each state assessed indicator included on the Blueprint carries a legend showing that it is assessed and indicating the category in which it will be reported (e.g., Assessed/Grammar=A/G).
- Mastered and Maintained (M) indicates a skill that has been introduced, developed, and assessed. Even though a skill may be formally assessed, the development and expansion of the skill still continues.

KEY
I = Introduced D = Developing A = State Assessed M = Mastered

REPORTING CATEGORY
N = Number & Operations AT = Algebraic Thinking C = Computation R = Real World Problem Solving
DP = Data Analysis & Probability ME = Measurement G = Geometry GR = Graphs & Graphing

NOTE: "A" Indicates the state curriculum (CRT) assessment only.
All the skills ("I" … "D" … "A" … "M") are addressed in classroom assessment.

MATHEMATICS
Seventh Grade

NUMBER AND OPERATIONS

The student will identify, represent, order, and compare numbers; and estimate, compute, and solve problems.

Key	Reporting Category	
M		Identify the place value of a given digit.
I		Develop meaning for perfect squares (e.g., 1, 4, 9, and 16).
I		Develop meaning for square roots.
I		Use exponential notation for powers of whole numbers.
I		Use a variety of models to demonstrate the relationships within the real number system (e.g., Venn diagrams, webs).
A	**N**	Represent numbers using a variety of equivalent forms (i.e., mixed numbers, fractions, decimals, percents, and integers).
A	**N**	Compare rational numbers using the appropriate symbol (<, >, and =).
A	**N**	Connect rational numbers to locations on a number line.
A	**N**	Connect percents greater than 100 and percents less than one to real-world situations.
A	**N**	Use ratios to represent quantitative relationships.
D		Understand and use ratios and proportions to represent quantitative relationships.
A	**N**	Identify the opposite and the reciprocal of a rational number.
D		Use concrete, pictorial, and symbolic representations for integers, including locations on a number line.
D		Apply number theory concepts to solve problems (e.g., divisibility, factors, multiples, composite numbers, prime numbers, prime factorization, and relatively prime).
A	**N**	Identify prime and composite numbers up to 50.
A	**N**	Compute efficiently and accurately with whole numbers, fractions, and decimals.
D		Understand the meaning and effects of arithmetic operations with fractions and decimals.
D		Use models to demonstrate meaning and effects of arithmetic operations with integers.
M		Apply the associative and commutative properties of addition and multiplication to simplify computations with integers, fractions, and decimals.
A	**N**	Apply order of operations when computing with whole numbers (no more than two parentheses and no exponents).
D		Apply order of operations when computing with decimals and fractions.
M		Understand and use the inverse relationships of addition and subtraction and multiplication and division to simplify computations and solve problems.
D		Select and use appropriate methods and tools for computing with whole numbers, fractions, decimals, percents, and integers in problem solving situations (e.g., mental computation, estimation, calculators, number line, computers, and paper and pencil).
D		Analyze procedures for computing with fractions, decimals, and integers.
D		Estimate the results of rational number computations in real-world situations.
A	**N**	Use estimation strategies to select a reasonable solution to a computation involving rational numbers.
D		Determine if the results of rational number estimates and computations are reasonable.
A	**N**	Select a reasonable solution to a real-world division problem in which the remainder must be considered.
A	**R**	Solve one- and two-step real-world problems involving whole numbers, fractions, and decimals.
D		Solve two-step real-world problems involving percents.
D		Develop methods for solving problems involving proportions (e.g., scaling, and finding equivalent ratios).

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ALGEBRA

The student will analyze and use symbols to generalize patterns, use properties of operations, and analyze change in various situations.

D		Represent, analyze, and extend geometric and numerical patterns.
A	**AT**	Extend geometric and numerical patterns.
I		Develop understanding for arithmetic sequences.
A	**AT**	Generalize patterns in data represented in tables and graphs.
A	**R**	Extend rate charts to solve real-world problems.
A	**AT**	Apply function rules.
D		Create function rules.
D		Demonstrate understanding of different uses of variables.
A	**AT**	Represent mathematical statements and real-world situations using symbols.
I		Translate one-variable verbal and written expressions into algebraic expressions.
A	**AT**	Evaluate algebraic expressions given the value of two or more variables.
A	**AT**	Solve one-step linear equations.
A	**AT**	Identify whole numbers that satisfy a given one-variable inequality.
D		Model algebraic equations with manipulatives, technology, and paper and pencil.
A	**R**	Solve real-world problems involving one-step linear equations.
I		Explore relationships between symbolic expressions and graphs of lines.
A	**GR**	Select a scatterplot to represent data presented in tabular form.
D		Create a scatterplot to represent data presented in a tabular form.
D		Describe the relationship between two quantities represented in a scatterplot.
D		Describe how changes in one quantity or variable result in changes in another.
A	**GR**	Interpret graphs which represent rates of change.
D		Use unit rates to solve problems (e.g., miles per hour, and words per minutes).

GEOMETRY

The student will analyze and describe characteristics and properties of 2- and 3-dimensional shapes, locate and specify points on a grid, and use geometric concepts (e.g., symmetry and transformations) and reasoning to solve problems.

A	**G**	Determine congruence of line segments, angles, and polygons.
A	**G**	Classify triangles by angle, size, and length of sides.
D		Compare and classify triangles by angle**,** size**,** and length of sides.
A	**G**	Determine the measure of an angle of a triangle, given the measures of the other two angles.
A	**G**	Classify polygons by properties.
D		Compare and classify polygons by properties.
D		Use appropriate mathematical language to describe similarity and congruence.
D		Locate and specify points on the coordinate plane.
A	**GR**	Use ordered pairs to describe given points in a coordinate system.
D		Relate symmetry and congruence to reflections (flips) about a line or to other transformations.
A	**G**	Identify the results of transformations of two-dimensional figures (i.e., turns/rotations, flips/reflections, slides/translations).
M		Use appropriate tools and methods to draw geometric objects with specified properties, (e.g., side lengths, and angle measure).

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M		Identify and build a three-dimensional object from a two-dimensional representation (net) of that object and vice versa.
A	**R**	Apply spatial reasoning and visualization to solve real-world problems.

MEASUREMENT

The student will determine time, length, perimeter, area, weight, capacity, and temperature and solve real-world problems involving measurement.

M		Understand both metric and customary systems of measurement.
A	**ME**	Convert from one unit to another within the same system.
A	**ME**	Select units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.
D		Understand, select, and use units of appropriate size and type to measure angles, perimeter, areas, surface area, and volume.
A	**ME**	Estimate length, perimeter, circumference, area, and volume using a variety of strategies.
A	**ME**	Determine the distance between two points on the x- or the y-axis in Quadrant I.
D		Select and apply techniques and tools to accurately measure length, perimeter, area, volume, and angles to appropriate levels of precision.
A	**ME**	Apply formulas to determine the areas of rectangles, triangles, parallelograms, trapezoids, and circles.
D		Develop and use formulas to determine the circumference of circles.
A	**ME**	Find or estimate area of irregular and complex shapes.
I		Develop strategies to determine the surface area and volume of selected prisms and cylinders.
D		Construct tables and graphs to represent rates of change.
A	**R**	Solve problems involving scale factors using ratios and proportions.

DATA ANALYSIS AND PROBABILITY

The student will collect, organize, analyze, interpret, and display data in tables and graphs and determine the probabilities of outcomes in simple experiments.

M		Formulate questions, design studies, and collect real-world data.
D		Construct, interpret, and use multiple-bar graphs, multiple-line graphs, and circle graphs displaying real-world data.
A	**DP**	Interpret circle graphs displaying real-world data.
A	**DP**	Interpret bar and line graphs to answer questions and solve real-world problems.
D		Find, use, and interpret measures of center and spread (e.g., mean, interquartile range).
A	**DP**	Determine the mean for a data set.
A	**DP**	Determine the median for a data set.
A	**GR**	Make predictions based on data.
D		Make conjectures and predictions based on data.
D		Recognize misleading representations of data.
A	**DP**	Connect data sets and their graphical representations (i.e., bar graphs, stem-and-leaf plots, box plots, and scatterplots).
D		Discuss and understand the relationship between data sets and their graphical representations (e.g., bar graphs, line graphs, circle graphs, histograms, stem-and-leaf plots, box plots, and scatterplots).
D		Make conjectures and predictions based on data.
A	**AT**	Use proportional thinking to make conjectures about results of experiments and simulations.
D		Make conjectures to formulate new questions for future studies.
D		Determine the probability for an outcome in an experiment.

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A	**DP**	Connect the symbolic representation of a probability to an experiment.
D		Construct a tree diagram to determine all possible outcomes of a simple event.
A	**DP**	Use a tree diagram or make an organized list to determine all possible outcomes of a simple compound event.

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